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*Science and Technology for Tomorrow's Aerospace Forces*

## Success Story

### 1.3-MICRON DIODE-PUMPED SOLID-STATE LASER SYSTEM USED IN LASER RADAR RESEARCH



The Directed Energy Directorate's Solid State Laser Products Group inserted a 1.3-micron diode-pumped solid-state laser system into a Munitions Directorate ladar system. Munitions Directorate researchers will use this laser to test receiver performance and collect metrology data to determine optimal wavelengths for multi-wavelength operation. Multi-wavelength ladar is an active (illuminator) remote-sensing technique that will enable much greater ability to discern objects since objects have different reflection properties at different wavelengths.



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### **Accomplishment**

The directorate developed and built a 1.3 micron diode-pumped laser system as part of an Air Force Office of Scientific Research effort to explore multi-wavelength laser radar. Directorate researchers are currently developing a second laser, operating at ~2.0 microns, in conjunction with the 1.3-micron system. This will allow Munitions Directorate researchers to explore the potential of such a multi-wavelength system for Air Force use.

### **Background**

The laser is an end-pumped Nd:YVO<sub>4</sub> laser that produces 1.1 watts average power at 1.342 microns with a beam quality of 1.2-1.3 at a Q-switching frequency of 20 KHz. The pump is a 15-watt Specification or Design Language 3460-P6 fiber-coupled diode array that directorate researchers packaged into a 19-inch rack mount box containing the associated electronics to digitally control the diode output power and temperature via keypad or RS-232 interface. The electronics include a diode current driver, an acoustic-optic Q-switch driver, thermo-electric cooler/controller, and a laser interlock system tied to the diode laser cooling.

Directed Energy  
Emerging Technologies

### **Additional information**

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTT, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (01-DE-16)